

Claims

What is claimed is:

1. An intravascular filter apparatus, comprising:
an elongate shaft having a distal end;
a generally cylindrical filter coupled to the shaft near the distal end, the filter having a length and a diameter; and
wherein the diameter of the filter is larger than the length.

2. The filter apparatus in accordance with claim 1, wherein the shaft comprises a catheter having a lumen extending therethrough.

3. The filter apparatus in accordance with claim 2, wherein the lumen comprises an aspiration lumen coupled to the filter.

4. The filter apparatus in accordance with claim 1, further comprising an expansion member slidably disposed within the shaft.

5. The filter apparatus in accordance with claim 4, wherein the expansion member is comprised of a radiopaque material.

6. The filter apparatus in accordance with claim 4, wherein the expansion member includes a generally straight proximal portion and a generally coiled distal portion.

7. The filter apparatus in accordance with claim 6, wherein the distal portion is comprised of nickel-titanium alloy.

8. The filter apparatus in accordance with claim 1, wherein the length of the filter is less than about 0.10 inches.

9. The filter apparatus in accordance with claim 1, wherein the filter is collapsible within an outer tubular member.

10. The filter apparatus in accordance with claim 1, wherein the filter includes a filter frame that is comprised of a super-elastic alloy.

11. An intravascular filter apparatus, comprising:
an elongate shaft disposed within the outer sheath, the shaft having a proximal end and a distal end;
a disc-shaped filter frame coupled to the shaft near the distal end, the filter frame having a diameter and a filter material coupled thereto; and
means for aspirating embolic debris from the filter material.

12. The filter apparatus in accordance with claim 11, wherein the shaft comprises a catheter having a lumen extending therethrough and wherein means for aspirating embolic debris includes the lumen.

13. The filter apparatus in accordance with claim 11, further comprising means for expanding the filter.

14. The filter apparatus in accordance with claim 13, wherein means for expanding the filter includes an expansion member slidably disposed within the shaft.

15. The filter apparatus in accordance with claim 14, wherein the expansion member is comprised of a radiopaque material.

16. The filter apparatus in accordance with claim 14, wherein the expansion member includes a generally straight proximal portion and a generally coiled distal portion.

17. The filter apparatus in accordance with claim 16, wherein the distal portion is comprised of nickel-titanium alloy.

18. The filter apparatus in accordance with claim 11, wherein the length of the filter frame is less than about 0.10 inches.

19. The filter apparatus in accordance with claim 11, wherein the filter frame is comprised of a super-elastic alloy.

20. The filter apparatus in accordance with claim 11, wherein the filter is collapsible within an outer tubular member.

21. A method of filtering embolic debris from a blood vessel, comprising the steps of:

providing an elongate tubular member having a filter frame collapsed therein, the filter frame being coupled to an elongate shaft and having a filter material coupled thereto;

advancing the tubular member to an area of interest within a blood vessel of a patient;

moving the tubular member relative to the shaft so as to shift the filter frame from a generally collapsed configuration to a generally expanded configuration, wherein expanded the filter frame is generally cylindrical in shape and has a diameter and a length, the diameter being larger than the length;

performing an intravascular procedure that generates embolic debris;

capturing embolic debris with the filter material; and

aspirating the filter material.

22. The method in accordance with claim 21, wherein the shaft comprises a catheter having a lumen extending therethrough and wherein the step of aspirating the filter material includes aspirating embolic debris through the lumen.

23. A method of filtering embolic debris from a blood vessel, comprising the steps of:

providing a elongate shaft having a filter frame coupled thereto, the filter frame having a filter material coupled thereto, the shaft having an expansion member disposed therein;

advancing the shaft to an area of interest within a blood vessel of a patient;

actuating the expansion member so as to shift the filter frame from a generally collapsed configuration to a generally expanded configuration, wherein expanded the filter frame is generally cylindrical in shape and has a diameter and a length, the diameter being larger than the length;

performing an intravascular procedure that generates embolic debris;

capturing embolic debris with the filter material; and

aspirating the filter material.

24. The method in accordance with claim 23, wherein the shaft comprises a catheter having a lumen extending therethrough and wherein the step of aspirating the filter material includes aspirating embolic debris through the lumen.

25. The method in accordance with claim 23, wherein the expansion member includes a proximal portion and a distal portion, and wherein the step of actuating the expansion member includes applying force in the distal direction to the proximal portion.

26. An intravascular filter apparatus, comprising:

an elongate shaft disposed within the outer sheath;
a filter coupled to the shaft, the filter having a length that is sufficiently small to permit use thereof at the junction of a portion of the renal artery and a kidney; and means for aspirating embolic debris from the filter.

27. An intravascular filter apparatus, comprising:
an elongate shaft disposed within the outer sheath;
a filter coupled to the shaft, the filter having a length that is sufficiently small to permit use thereof at the junction of a portion of the renal artery and a kidney;
means for aspirating embolic debris from the filter; and
means for shifting the filter between a generally collapsed configuration and a generally expanded configuration.

28. A method of filtering embolic debris from a the renal artery, comprising the steps of:
providing an elongate tubular member having a filter frame collapsed therein, the filter frame being coupled to an elongate shaft and having a filter material coupled thereto;
advancing the tubular member to the junction of a portion of the renal artery and a kidney;

retracting the tubular member relative to the shaft so as to shift the filter frame from a generally collapsed configuration to a generally expanded configuration, wherein

RECEIVED
U.S. PATENT OFFICE
JULY 1973

expanded the filter frame is generally cylindrical in shape and has a diameter and a length, the diameter being larger than the length;

performing an intravascular procedure that generates embolic debris;

capturing embolic debris with the filter material; and

aspirating the filter material.

29. A method of filtering embolic debris from a the renal artery, comprising the steps of:

providing a elongate shaft having a filter frame coupled thereto, the filter frame having a filter material coupled thereto, the shaft having an expansion member disposed therein;

advancing the shaft to the junction of a portion of the renal artery and a kidney;

actuating the expansion member so as to shift the filter frame from a generally collapsed configuration to a generally expanded configuration, wherein expanded the filter frame is generally cylindrical in shape and has a diameter and a length, the diameter being larger than the length;

performing an intravascular procedure that generates embolic debris;

capturing embolic debris with the filter material; and

aspirating the filter material.